

Segmenting CT images of bronchogenic carcinoma with bone metastases using PET intensity markers approach.

ABSTRACT

Background. The evolution of medical imaging plays a vital role in the management of patients with cancer. In oncology, the impact of PET/CT imaging has been contributing widely to the patient treatment by its large advantages over anatomical imaging from screening to staging. PET images provide the functional activity inside the body while CT images demonstrate the anatomical information. Hence, the existence of cancer cells can be recognized in PET image but since the structural location and position cannot be defined on PET images, we need to retrieve the information from CT images. **Methods.** In this study, we highlight the localization of bronchogenic carcinoma by using high activity points on PET image as references to extract regions of interest on CT image. Once PET and CT images have been registered using cross correlation, coordinates of the candidate points from PET are fed into seeded region growing algorithm to define the boundary of lesion on CT. The region growing process continues until a significant change in bilinear pixel values is reached. **Results.** The method has been tested over eleven images of a patient having bronchogenic carcinoma with bone metastases. The results show that the mean standard error for over segmented pixels is 33% while for the under segmented pixels is 3.4%. **Conclusions.** Although very simple in implementation, region growing can result in good precision ROIs. The region growing method highly depends on where the growing process starts. Here, by using the data acquired from other modality, we tried to guide the segmentation process to achieve better segmentation results.

Keyword: Computed tomography segmentation; Dual modality imaging; PET/CT.